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Do Tax Policies in Nigeria Have Similar Implications for the Manufacturing Sector Output?

Musa Abdullahi Sakanko[1*], Jeremiah Nshe Manomi[2], Abubakar Ijoko[3], Usman Abdulkareem Audu[4]

[1,2]**Department of Economics, University of Jos, Plateau State Nigeria**
[3]**Department of Economics, Nigeria Army University Biu, Borno State, Nigeria**
[4]**Department of Economics, University of Abuja, Abuja Nigeria**
E-mail: [1]sakanko2015@gmail.com, [2]nshemanomi@gmail.com, [3]abuijoko@gmail.com, [4]usman.abdulkareem@gmail.com

[*)]**Corresponding Author**

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Abstract

The study examines whether tax policies in Nigeria have similar implications on the manufacturing sector's output during the 1994Q1-2020Q4 period using the ARDL bounds testing approach. The bounds testing result suggests the presence of cointegration between tax policies and the manufacturing sector output. Further, the estimation results demonstrate that company income tax (CIT) and import tax are positively related to manufacturing sector output. In contrast, value-added tax (VAT) has a negative effect on the manufacturing sector output, both in the short- and long-term. In addition, the results of the Granger causality test indicate a unidirectional causal relationship running from tax policies to the manufacturing sector output and not vice versa. Thus, policies and measures are recommended to prioritize the CIT and import tax, review the assortment in the VAT, and ensure accountability and transparency in the tax system.

Keywords:
ARDL, manufacturing, tax policy

How to Cite:

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INTRODUCTION

The fastest way a country can attain sustainable economic growth and development is neither through its vast human or material resources but through enterprise development, technological innovation, and industrial capacity (Olamade et al., 2020). To realize sustainable economic growth and development, the governments of various developing countries often adopt different measures and approaches to propel the economy's growth and development.

However, it is impossible to achieve sustainable growth and development without a viable manufacturing sector. Also, evidence suggests that the manufacturing sector tends not to be feasible without effectively utilizing tax revenue to create an enabling environment for firms to thrive, specifically through providing good and quality infrastructures such as electricity, hospitals, good roads, et cetera. Theoretically, it is conceived that tax is negatively related to investment because it causes an impairment in the economy. Typically, high tax rates discourage new investment and entrepreneurship investment expansion. For instance, company profit tax is statutorily levied on incorporated organizations. The burden and incidence are generally seen to be distributed to the entire participants in the production value chain, thus directly impacting every participant. However, evidence also suggests that by lowering marginal tax rates or replacing the federal income tax with a consumption tax, the work effort, saving, and investment can be increased, consequently leading to a significant increase in firms' productivity (Hammed, 2018).

Similarly, it is argued that if governments grant firms some incentive, it directly leads to a decline in company income tax rates. That policy will generally attract investment, accumulation of capital, and innovation (Engen & Skinner, 2008), leading to an increase in output. Empirically, some authors, including Yoke & Chan (2018) and Okpe (2018), argued that tax policy has an adverse implication on the manufacturing sector. On the contrary, some other studies indicate a positive relationship between tax policy and manufacturing (see Adefeso, 2018; Ewubare & Ozo-Eson, 2019; Oladipo et al., 2019).

Over time, available statistics on manufacturing output growth and tax policies (including company income tax, import tax, and value-added tax) in Nigeria present an exciting relationship between manufacturing sector output and tax policy. Specifically, a cursory look at statistics illustrates the revenue accrued from company income tax (CIT), import tax, and value-added tax (VAT) from 1994 until 2020. There is an increase in the real term. The country's manufacturing sector output growth has maintained a fluctuating trend during the same periods (see Figure 1).

Evidence suggests that the slow performance of the manufacturing sector in Nigeria is due in part to the absence of the harmonization and default in the coordination of tax policy, multiplicity of the tax system, and inappropriate networking in the tax administration (National Bureau of Statistics [NBS], 2020). In addition, the Federal Ministry of Finance (2013) opined that multiple tax systems, lack of taxation power clarification, and tax revenue accountability also play a significant role in the poor and sluggish growth of the manufacturing sector. Besides that, this policy will also lead to a reduction in the capacity and output of the manufacturing sector (Tomola et al., 2012).

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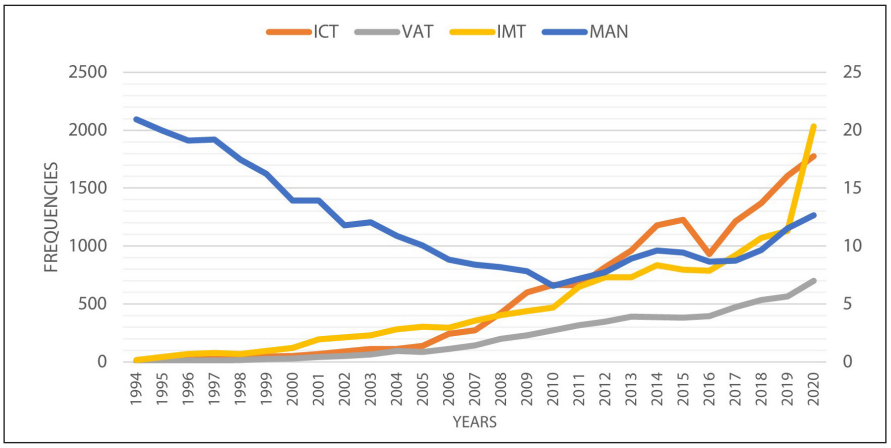
Some studies argue that several factors mainly cause the slow performance of the sector. The factors are inadequate electricity supply, smuggling of foreign products, exchange rate depreciation, interest rate, corruption, trade policies, decayed infrastructures, technological backwardness, and absence of access to credit facilities (Adewuyi, 2006; Agwu et al., 2017; Loto, 2012; Rasheed, 2010).

Figure 1. Relationship between Tax Policies and Manufacturing Sector in Nigeria



Source: Authors computation extracted from excel (2022)

Despite the unclear nature of the relationship between tax policies and manufacturing sector output in Nigeria, most empirical studies focused on the effect of fiscal policy, corporate tax, and value-added tax on the manufacturing sector. Moreover, researchers did not deem it essential to identify whether the tax policies have similar implications for manufacturing sector output. To the best of the researchers' knowledge, the current study failed to explore the combined effect of tax policies (company income tax, value-added tax, and import tax) on the manufacturing sector in Nigeria. Hence, an attempt to investigate whether tax policies (company income tax, value-added tax, and import tax) in the country have similar implications on the manufacturing sector.

The present study is built on the Keynesian theory of government intervention in the economy, which Wagner, peacock, and Solow further detailed. The idea assumed that government involvement in the economy could ensure the effective and efficient distribution of goods and services. Besides that, the government must provide the needed structures and facilities to promote the growth of the manufacturing firms through fiscal policies such as tax, government spending, subsidy, and monetary policies while lowering the interest rate, foreign exchange, loans, Central bank advances, et cetera (Okpe, 2018). Wagner's law of expanding state activities suggests that government spending in the economy can engender industrialization and economic development. In summary, the theory buttressed that government involvement in the manufacturing sector through infrastructure, credit facilities, subsidies, and cheap foreign exchange, tends to increase manufacturing sector output contribution to economic growth and development.

Over time, several empirical studies have been conducted to explore the effect of tax and fiscal policies on the manufacturing sector. Some studies illustrate that corporate tax

and manufacturing sector output are positively related in Nigeria (Adefeso, 2018; Ewubare & Ozo-Eson, 2019; Hammed, 2018; Oladipo et al., 2019), and some others indicate a negative relationship (Okpe, 2018). Eze & Ogiji (2013) suggest that public expenditure is positively related to the manufacturing sector. Also, Ezejiofor et al. (2015) demonstrate a significant positive relationship between tax and the performance of Nigerian manufacturing companies. In addition, Arikpo et al. (2017) show that tax revenue has a significant positive effect on the manufacturing sector output in Nigeria from 1982 to 2014. Moreover, Etim et al. (2020) conclude that personal income tax and petroleum profit tax are positively related to manufacturing sector output in Nigeria from 1985 to 2018. Also, Ogu & Kem (2020) indicate that, while CIT positively affects the manufacturing sector output, customs and excise duty are negatively related to manufacturing sector output.

Furthermore, Yoke & Chan (2018) employed a panel regression approach to examine the effect of VAT on manufacturing sector performance in the Association of Southeast Asian Nations (ASEAN) countries. The results suggest that VAT has an adverse effect on manufacturing performance. In addition, Andabai (2019) employed the Granger causality to investigate the relationship between tax collection and manufacturing sector output in Nigeria. The result demonstrates that CIT, VAT, and personal income tax Granger cause manufacturing sector output in Nigeria.

Clearly, a survey of the literature illustrates that, while empirical studies on the relationship between fiscal policy (taxation) and manufacturing output in Nigeria abounds, there is a dearth of such studies which examine the combined effect of tax policies on the output of the manufacturing sector in the country. In addition, the estimation techniques adopted in most of these studies are found to be less robust than the Autoregressive distributed lag (ARDL) bounds testing approach used in the present study. Therefore, the current research is significant and contributes to the existing literature by examining whether tax policy (CIT, import tax, and VAT) has a similar implication on the manufacturing output in Nigeria using rich quarterly datasets spanning from 1994Q1 to 2020Q4. Lastly, by assessing the specific effects of tax policies on manufacturing output, the study is expected to provide practical insight into fiscal policy-making in Nigeria.

METHODS

Based on the nature of the study, quarterly time-series data covering the period from 1994Q1 to 2020Q4 are adopted. The choice of the period was guided by the availability of data for tax policies. Data were collected from the Central Bank of Nigeria (CBN) annual statistical bulletin, National Bureau of Statistics (NBS), Nigeria Custom service (NCS), and the World Bank's World Development Indicators (WDI). Specifically, the data on company income tax and value-added tax were sourced from CBN bulletin, while the data on exchange rate, interest rate, and manufacturing output were collected from WDI. Also, the data on import duties are sourced from NCS.

A functional relationship from this research shows in equation (1) to examine the relationship between manufacturing output and tax policies.

$$MAN = f(CIT, VAT, IMT, EXR, INT) \quad (1)$$

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Where: MAN is manufacturing sector output, company income tax is CIT, VAT denotes value-added tax, IMT represents import duties, EXR denotes the exchange rate, and interest is INT. The model in equation (1) is re-written in an explicit form to estimate the relationship.

$$MAN_t = \beta_0 + \beta_1 CIT_t + \beta_2 VAT_t + \beta_3 IMT_t + \beta_4 EXR_t + \beta_5 INT_t + \mu_t \quad (2)$$

Where β_0 is constant/intercept, β_1 to β_5 presents the parameter estimates or slope of the variables; μ is the error term or random variable, which accounts for the effect of other variables.

Using the ARDL approach is using the model by Pesaran et al. (2001). This research uses the ARDL bounds testing approach to test the long-run relationship between the manufacturing sector, CIT, VAT, import tax, interest rate, and exchange rate. First, the stationarity properties of the series are observed using the ADF and Phillips-Perron unit root tests. This is done to ascertain that none of the variables is stationary at I(2). Secondly, the ARDL model is estimated using the automatic optimal lag specifications based on the Akaike information criterion (AIC). This is followed by bounds testing to check for a co-integrating relationship between the dependent and the explanatory variables. The ARDL form of the model specified for this study is given as:

$$\begin{aligned}\Delta MAN_t = {} & c_0 + c_1 t + \pi_1 CIT_{t-1} + \pi_2 VAT_{t-1} + \pi_3 IMT_{t-1} + \pi_4 EXR_{t-1} \\ & + \pi_5 INT_{t-1} + \sum_{i=1}^{p} \gamma_i \, \Delta \mathrm{MAN}_{t-i} + \sum_{j=1}^{q} \delta_j \, \Delta \mathrm{CIT}_{t-j} + \sum_{k=1}^{r} \theta_k \, \Delta \mathrm{VAT}_{t-k} \\ & + \sum_{l=1}^{s} \emptyset_l \, \Delta \mathrm{IMT}_{t-l} + \sum_{k=1}^{t} \theta_k \, \Delta \mathrm{EXR}_{t-k} + \sum_{l=1}^{u} \emptyset_l \, \Delta \mathrm{INT}_{t-l} + \varepsilon_t \end{aligned} \quad (3)$$

$$\begin{aligned}\Delta MAN_t = {} & c_0 + c_1 t + \pi_1 CIT_{t-1} + \pi_2 VAT_{t-1} + \pi_3 IMT_{t-1} + \pi_4 EXR_{t-1} + \pi_5 INT_{t-1} \\ & + \sum_{i=1}^{p} \gamma_i \, \Delta \mathrm{MAN}_{t-i} + \sum_{j=1}^{q} \delta_j \, \Delta \mathrm{CIT}_{t-j} + \sum_{k=1}^{r} \theta_k \, \Delta \mathrm{VAT}_{t-k} + \sum_{l=1}^{s} \emptyset_l \, \Delta \mathrm{IMT}_{t-l} \\ & + \sum_{k=1}^{t} \theta_k \, \Delta \mathrm{EXR}_{t-k} + \sum_{l=1}^{u} \emptyset_l \, \Delta \mathrm{INT}_{t-l} + ECM_{t-1} + \varepsilon_t \end{aligned} \quad (4)$$

Where c_0 is the intercept, c_1 is the slope of the time trend, π_1 *is* slope of one lag period of CIT, π_2 is slope of VAT, π_3 denote the slope of IMT, π_4 and π_5 give the slope of *EXR* and *INT. p,q, r, s,t,* and u are the periods of the differenced term of the response variable and the regressors, respectively, and ECM_{t-1} and ε_t is the error correction term and error term. The error correction term measures the speed of adjustment when disequilibrium occurs in the short-run to ascertain equilibrium in the long-run. Therefore, the lag structure of this model are: $ARDL(p,q,r,s,t,u)$.

RESULT AND DISCUSSIONS

The summary of the descriptive statistics of the variables in this study shows in Table 1. The descriptive statistics show that the average growth rate of manufacturing sector output during the period was 11.84, with a standard deviation of 4.24. In addition, the mean score of CIT is 544.36, LVAT is 2.02, while the average of LIMT is 11.48,

EXR is 115.37, and INT is 18.26. CIT has the highest deviation, followed by EXR. Furthermore, the Skewness property indicates that MAN, EXR, and INT spread from the right-hand side of the normal curve, while LVAT and LIMT spread to the left-hand side of the normal curve. Equally, the Jarque-Bera property suggests that the data are normally distributed. The positive values of the Kurtosis being greater than 1 indicate a higher or too peak distribution.

Table 1. Descriptive Statistics

Variables	N	Mean	Std. Dev	Skewness	Kurtosis	Jarque-Bera
MAN	108	11.835	4.241	0.854	2.444	14.517***
CIT	108	544.357	549.501	0.732	2.223	12.374***
LVAT	108	2.021	0.638	-0.588	2.090	9.860***
LIMT	108	11.477	0.499	-0.687	2.920	8.522**
EXR	108	115.365	48.936	1.930	6.077	109.685***
INT	108	18.258	2.473	0.746	3.412	10.784***

Source: Authors computation (2021) Significance at *** 1%, ** 5%, and * 10%

In addition to the summary statistics of the series, the pairwise correlation and covariance are also considered. The pairwise correlation is used to know the correlation among the variables, whether positive/negative, weak, moderate, or strong. The results are summarized in Table 2. The values reported in the bracket represent the coefficient of the covariance. The results demonstrate a positive but moderate correlation between exchange rate and the manufacturing sector and a positive but weak correlation between interest rate and the manufacturing sector. On the contrary, the results indicate a significant, strong, and negative correlation between tax policies (CIT, VAT, and import tax) and the manufacturing sector.

Table 2. Pairwise correlations and Covariance

Variables	EXR	ICT	INT	LIMT	LVAT	MAN
EXR	1.000 (2372.549)					
CIT	-0.093 (-2488.659)	1.000 (299155.1)				
INT	-0.167* (-20.061)	0.691*** (-930.955)	1.000 (6.059)			
LIMT	-0.331*** (-7.767)	0.848*** (230.387)	-0.625*** (-0.764)	1.000 (0.247)		
LVAT	-0.351*** (-11.141)	0.848*** (294.775)	-0.649*** (-1.015)	0.984*** (0.311)	1.000 (0.404)	
MAN	0.521*** (107.101)	-0.508*** (-1174.079)	0.447*** (4.648)	-0.829*** (-1.738)	-0.875*** (-2.346)	1.000 (17.821)

Source: Authors computation (2021) Significance at **** 1%, ** 5%, and * 10%*

The unit root test was conducted using the ADF and PP tests. The results are presented in Table 3. The probability value of the PP revealed that MAN, LVAT, LIMT, and EXR

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are integrated of order zero I(0) at 5 percent and 10 percent levels. On the other hand, ADF and PP indicate that CIT and INT are stationary after taking their first difference. The mixture of I(0) and I(1) justifies using the ARDL bounds testing for cointegration.

Table 3. Unit root results

Variable	LEVEL				FIRST DIFFERENCE			
	ADF	Order	PP	Order	ADF	Order	PP	Order
MAN	0.395	NS	0.132*	I(0)	0.644	NS	0.000***	I(1)
CIT	0.999	NS	0.991	NS	0.001***	I(1)	0.000***	I(1)
LVAT	0.234	NS	0.004***	I(0)	0.358	NS	0.000***	I(1)
LIMT	0.894	NS	0.112*	I(0)	0.000***	I(1)	0.000***	I(1)
EXR	0.159	NS	0.134*	I(0)	0.000***	I(1)	0.000***	I(1)
INT	0.645	NS	0.621	NS	0.000**	I(1)	0.000***	I(1)
Fisher chi-square	9.535		24.530**		163.505***		403.067***	
Choi Z-stat	1.068		1.036		9.024***		19.149***	

Notes: The NS denotes not stationary, I(0) and I(1) denotes stationary at level and first difference.
Source: Authors computation (2021) Significance at **** 1%, ** 5%, and * 10%*

The result of the bounds testing is reported in Table 4. The result demonstrates that the F-statistics value (5.543) is greater than the upper critical value at the 1 percent level. This result, therefore, confirms the presence of cointegration between manufacturing sector output, tax policy, exchange rate, and interest rate.

Table 4. Result of the Bounds Test

Test Statistics	Value	Significance	I(0)	I(1)
F-statistics	5.543	10%	2.08	3.00
K	5	5%	2.39	3.38
		1%	3.06	4.15

Source: Authors computation (2021)

Given the confirmation of the cointegration relationship between the variables, the ARDL model is estimated, considering the optimal lag length suggested by AIC. The long-run and short-run estimates of the selected model are summarized in panel A and panel B of Table 5, respectively. The long-run result shows that company income tax, import tax, and exchange rate significantly affect the manufacturing sector at a 1 percent level. In contrast, the value-added tax is negatively related to manufacturing sector output and significant at a 1 percent level. Specifically, a percent increase in the company income tax will raise manufacturing output by 0.005 percent in the long run. Also, an increase in imports by a percent will lead to the expansion of the manufacturing output by 11.758 percent. In addition, a unit increase in value-added tax will reduce manufacturing sector output by 16.517 percent. Moreover, a percent increase in the exchange rate will increase manufacturing sector output by 0.017 percent.

Table 5. Results of the ARDL Model

Panel A: Long-run Coefficients – Dependent variable is *MAN*		
Regressor	**Coefficient**	**t-statistic**
CIT_t	0.005	7.152***
$LIMT_t$	11.758	5.067***
$LVAT_t$	-16.517	-11.068***
EXR_t	0.017	3.421***
INT_t	0.057	0.688
Panel B: Short-run Coefficients – Dependent variable is *ΔMAN*		
Regressor	**Coefficient**	**t-statistic**
ΔCIT_t	0.004	6.795***
$\Delta LIMT_t$	4.807	5.499***
$\Delta LVAT_t$	-7.938	-7.980***
ΔEXR_t	0.000	0.263
ΔINT_t	-0.138	-2.978***
ECM_t	-0.312	-6.443***
$R^2 = 0.620$	$R^{-2} = 0.575$	DW = 1.685

Source: Authors computation (2021) Significance at **** 1%*

Similarly, the short-run result shows that company income tax, import tax, and exchange rate are positively related to the manufacturing sector output. In contrast, value-added tax and the interest rate significantly negatively impact the manufacturing sector's output. A percent increase in CIT will lead to a 0.004 percent reduction in the manufacturing sector output. Also, a one percent increase in the import tax will cause manufacturing sector output to increase by 4.807 percent. Further, a unit increase in value-added tax leads to a 7.935 percent decrease in the manufacturing sector output. In addition, a one percent increase in interest rate will lead to about a 0.057 percent reduction in the manufacturing sector output. The coefficient of determination (R^2) shows that the explanatory variables cause 62 percent of the variation in the manufacturing sector output. The coefficient of the error correction term lagged by one period was found to be correctly signed, statistically significant, and less than unity. This result suggests that about 31 percent of deviations will be corrected within a quarter.

Table 6. Diagnostic and Stability Tests

Tests	**Statistics**	**Prob.**
Normality	Jarque-Bera	0.000
Serial correlation	Breusch-Godfrey	0.191
Heteroscedasticity	Breusch-Pagan-Godfrey	0.325
Ramsey RESET	F-statistics	0.096
CUSUM	Stable	0.05
CUSUMQ	Stable	0.05

Source: Authors' Computation (2021)

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The results of the diagnostic and model stability tests reported in Table 6 indicate that the ARDL model does not have problem of serial-correlation, functional form, normality and heteroscedasticity. In particular, the corresponding probability values of the Breusch-Godfrey serial-correlation Langrange Multiplier (ML) tests and Breusch-Pagan-Godfrey heteroscedasticity LM test (0.325) illustrate the absence of autocorrelation and heteroscedasticity. In addition, the Jarque-Bera test suggest that the errors are normally distributed, while the Ramsey RESET demonstrate that the model is well-specified. Lastly, the CUSUM and CUSUMSQ tests show that the coefficient of the ARDL model are stable.

Table 7. Pairwise Granger Causality Tests Result

Null Hypothesis	F-statistics
CIT does not Granger Cause MAN	3.597**
MAN does not Granger Cause CIT	0.841
LIMT does not Granger Cause MAN	2.235*
MAN does not Granger Cause LIMT	0.559
LVAT does not Granger Cause MAN	2.878*
MAN does not Granger Cause LVAT	0.391
EXR does not Granger Cause MAN	0.689
MAN does not Granger Cause EXR	1.557*
INT does not Granger Cause MAN	0.903
MAN does not Granger Cause INT	0.744

Source: Authors computation (2021) Significance at *** 1%, ** 5%, and * 10%*

The Granger causality procedure is adopted to determine the causal relationship between the series. The results of the Granger causality tests are reported in Table 7. The results demonstrate a unidirectional Granger causality running from company income tax, import tax, and value-added tax to the manufacturing sector output in Nigeria. This result validates the outcome of previous research (Andabai, 2019). In addition, the results indicate a unidirectional Granger causality from manufacturing sector output to exchange rate.

The estimation results reveal exciting implications. For instance, the positive relationship between company income tax and the manufacturing sector output in Nigeria, both in the long-run and short-run, aligns with the findings of several studies (see Adefeso, 2018; Andabai, 2019; Aziz & Sharifuddin, 2019; Ehinomen et al., 2017; Ewubare & Ozo-Eson, 2019; Hammed, 2018; Oladipo et al., 2019; Ubesie et al., 2020; Uwuigbe, 2016). However, Okpe (2018), and Uffie & Aghanenu (2019) found the contrary outcome. The positive relationship between CIT and manufacturing sector output implies that an increase in the company income tax rate can raise the manufacturing sector output. Since the increase in company income tax implies higher tax revenues to the government (other things being equal). It is expected that the effective utilization of tax revenues from CIT in providing public goods and services (such as roads, power, water, and security) will lower the cost of production, consequently leading to improved productivity in the manufacturing sector.

In addition, the positive effect of import tax on manufacturing tax validates the empirical finding of several studies (Arogundade et al., 2015; Ogu & Kem, 2020). The outcome suggests that the increase in import tax will discourage the import of goods and services, leading to an increase in the manufacturing sector's demand, performance, and productivity. Furthermore, the results indicate that VAT has an adverse impact on manufacturing sector output both in the short- and long-term, thus confirming the findings of previous studies (Etim et al., 2020; Ewubare & Ozo-Eson, 2019; Oladipo et al., 2019; Yoke & Chan, 2018). Since consumers directly bear the VAT cost, the increased VAT will negatively affect the demand for goods, thus lowering the growth of the manufacturing output.

CONCLUSION

The study examined whether tax policies in Nigeria have similar implications for the manufacturing sector output in Nigeria during the 1994Q1-2020Q4 period using the ARDL bounds testing approach to cointegration. The bounds testing results demonstrate the presence of cointegration between manufacturing sector output and tax policies (VAT, CIT, and import tax) alongside interest and exchange rates. In addition, the estimation results indicate that company income tax and import tax have a positive effect on manufacturing sector output. In contrast, the value-added tax is negatively associated with manufacturing sector output. Furthermore, the Granger causality test results show a unidirectional causal relationship running from company income tax, import tax, and value-added tax to the manufacturing sector.

Therefore, the study recommends policies and measures to prioritize the company income tax and import tax as tax policy instruments to improve Nigeria's manufacturing sector's performance. In addition, accountability, transparency, and effective and efficient use of taxes collected to provide viable social infrastructures that will aid the growth of the manufacturing sector are advanced. Lastly, the government and the tax administrators are advised to review the diversity in the tax system, especially the VAT from the 7.5% benchmark, to reduce its adverse effect on individuals, companies, and government agencies.

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